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INFO 655-01 Business Intelligence

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**Business Intelligence
INFO 655
Spring 2012**

Instructor: Dr. Mark N. Frolick
Office: 202 Smith Hall
Office Hours: 4:00pm – 6:00pm day of class meeting & by appointment
Contact Information: frolick@xavier.edu (by far the best way to reach me)

Mission of the Williams College of Business at Xavier University
"We educate students of business, enabling them to improve organizations and society, consistent with the Jesuit tradition"

Course Description

The purpose of this course is to introduce you to Business Intelligence. Business Intelligence refers to the use of the computers to analyze complex information about an organization and its competitors for use in business planning and decision making. The objective is to create more timely and higher quality input to the decision process.

Business intelligence is one of the current “hot topics”. It is an area which is growing despite the economic downturn in technology as companies realize that they must improve their understanding of their capabilities and those of the competition if the quality of their decisions is to be competitive.

The field of Business Intelligence (BI) is evolving from its origins as a support tool for executives to a shared commodity by managers, analysts, and top executives at almost all medium and large companies. Business Intelligence integrates previously independent tools and technologies into a systematic, unified software suite for the most accurate and timely information.

This course takes a managerial approach to Business Intelligence, and therefore emphasizes the BI applications and implementations. This exposure allows students to truly understand how Business Intelligence works so they can adopt it in their future managerial roles.

Extensive, vivid examples from large corporations, small businesses, and government and not-for-profit agencies from all over the world make difficult concepts more accessible and relevant.

International examples of global competition, partnerships, and trade are also provided throughout. These real-world case studies show students the capabilities of BI, its cost and justification, and the innovative ways real corporations are using BI in their operations.

Primary Course Objectives

- By the end of the course, you should be able to describe the concepts of business intelligence (BI) and be able to explain their components, such as operational data stores, data warehouses, data marts, and data access tools.
- You should understand that databases do not operate as separate islands of information, but rather need to be coordinated into a cohesive enterprise system plan that supports the operational, tactical, and strategic needs of the organization. Be familiar with the wide range of business processes that must be effectively managed for success.
- You should understand the issues that affect the success and failure of BI. You also need to understand the many issues that complicate data warehouse construction and maintenance. For example, how to manage metadata so business analysts can use the stored data more effectively is an issue. By the end of the course, you should be able to explain different types of problems and issues that need to be addressed on data warehouse and BI projects
- You should be aware of the variety of software tools available for each part of the data warehousing/BI process. When addressing the business intelligence needs within an organization, you need to understand that a data warehouse must be flexible enough to accommodate people with diverse decision-making needs, whose abilities may range from novice to power user.
- You should be aware of the emerging trends in the data warehousing/BI industry. These trends may include topics like customer relationship management, business performance management, and real-time/tactical decision making.

Texts and Course Materials

Required Texts:

- Turban, et. al.
 - Business Intelligence, A Managerial Approach
 - ISBN-10: 013234761X
 - ISBN-13:9780132347617
- The Teradata Student Network (www.TeradataStudentNetwork.com) is a free resource sponsored by Teradata and vendor partners, such as MicroStrategy. The site includes articles, webinars, software, and even Teradata certification. The site also includes a list of related sites that are worth exploring.
 - Any material with a prefix of TUN can be downloaded from this website for free.

- Use password: Big Data
- Harvard Material can be found at:

<http://cb.hbsp.harvard.edu/cb/access/11503349>

I have created a course area on the Harvard Business Online website where you can order the required materials for this course.

If you have not registered with Harvard Business Online, you will be required to do so. This URL will provide you with a list of required materials for use in this course. The products are listed at the bottom of this email.

Note that the products' format may differ; some may require that a hardcopy be shipped to you via air mail. The downloaded course materials are encrypted using SealedMedia. Use the following link to download the plug-in.

<http://download.sealedmedia.com/unsealer/index.asp>

You will have immediate access to the materials upon placing your order, for subsequent access, you must login to <http://harvardbusinessonline.org>

I hope you find this a convenient way to access your course materials.

For technical assistance, please view the [Quick Tips](#) section or contact Harvard Business School Publishing at 1-800-810-8858 or 617-783-7700. They are open 8am-6pm Eastern Standard Time. They can also be reached at techhelp@hbsp.harvard.edu

Additional Resources

There are many resources that can help you in your data warehousing and business intelligence education. Resources that I highly recommend:

- The Data Warehousing Institute (www.dw-institute.com) sponsors regional training courses and quarterly conferences that are outstanding. They also sponsor *The Business Intelligence Journal*, which publishes very strong articles.
- DM Review (www.DMReview.com) is the leading practitioner publication for this space. I highly recommend that you register for DM Review if you are interested in data warehousing and BI.

Supplemental Readings:

Book(s):

- Ayres, Ian.
 - Super Crunchers: Why Thinking-by-Numbers Is the New Way to Be Smart
 - ISBN: 978-0-553-80540-6

Articles (Frolick):

Hill, Adam, Thilini R. Ariyachandra, and Mark N. Frolick, "10 Principles to Ensure Your Data Warehouse Implementation is a Failure," International Journal Of Business Intelligence Research, Vol. 2, No. 2, April-June 2011, pp. 37-47.

Schutte, Sam, Thilini R. Ariyachandra, and Mark N. Frolick, "Test Driven Development of Data Warehouses," International Journal Of Business Intelligence Research, Vol. 2, No. 1, January-March 2011, pp. 64-73.

Smith, Greg, Mark N. Frolick, and Thilini R. Ariyachandra. "Business Intelligence in the Bayou: Recovering Costs in the Wake of Hurricane Katrina," International Journal Of Business Intelligence Research, Vol. 1, No. 2, April-June 2010, pp. 21-29.

Hobeck, Robert, Thilini R. Ariyachandra, and Mark N. Frolick. "The Importance of Soft Skills in Business Intelligence Implementation Efforts," Business Intelligence Journal" Vol. 14, No. 1, 1st Quarter 2009, pp. 28-36.

Ariyachandra, Thilini R. and Mark N. Frolick. "Critical Success Factors in Business Performance Management – Striving for Success." Information Systems Management, Vol. 25, No. 2, Spring 2008, pp. 113-120.

Crable, Elaine, James Brodzinski, and Mark N. Frolick. "The Intelligent New Business Electronic Application and Automated Underwriting Solution at The Western-Southern Life Insurance Company." Information Systems Management, Vol. 25, No. 2, Spring 2008, pp. 155-158.

Frolick, Mark N. and Mark von Oven.. "Taking the Repeat Out of Research & Development: The BI Collaboration Approach," Business Intelligence Journal" Vol. 11, No. 3, 3rd Quarter 2006, pp. 21-26.

Frolick, Mark N. Thilini R. Ariyachandra. "Business Performance Management: One Truth," Information Systems Management, Vol. 23, No. 1, Winter 2006, pp. 41-48.

Kreyenhagen, Mark B., Connie B. Robbins, Elaine Crable, and Mark N. Frolick. "The Western and Southern Life Insurance Company: A Data Warehousing Success Story," Business Intelligence Journal" Vol.9, No. 2, Spring 2004, pp. 57-63.

Lindsey, Keith and Mark N. Frolick. "Critical Factors for Data Warehousing Failures," Journal of Data Warehousing," Vol. 8, No. 1, Winter 2003, pp. 48-54.

Huang, Zhenyu. Lei-Da Chen, and Mark N. Frolick. "Integrating Web Data into a Data Warehouse," Information Systems Management, Vol. 19, No. 1, Winter 2002, pp. 23-34.

- Parzinger, Monica and Mark N. Frolick. "Creating Competitive Advantage Through Data Warehousing," Information Strategy: The Executives Journal, Vol. 17, No. 4, Summer 2001, pp. 10-15.
- Chen, Lei-Da, Khalid Soliman, En Mao. And Mark N. Frolick. "Measuring User Satisfaction with Data Warehouses: An Exploratory Study," Information and Management, 37 (2000), pp 103-110.
- Chen, Lei-Da, and Mark N. Frolick. "Web-Based Data Warehousing: Fundamentals, Challenges, and Solutions," Information Systems Management, Vol. 17, No. 2, Spring 2000, pp. 80-86.
- Chen, Lei-Da, Toru Sakaguchi and Mark N. Frolick. "Data Mining Methods, Applications, and Tools," Information Systems Management, Vol. 17, No. 1, Winter 2000, pp. 65-70.
- Sakaguchi, Toru, and Mark N. Frolick. "A Review of the Data Warehousing Literature," Journal of DataWarehousing, Vol. 2, No. 1, January 1997, pp. 34-54.
- Frolick, Mark N., Monica J. Parsinger, R. Kelly Rainer Jr., and Narender K Ramarapu. "Using EISs Environmental Scanning," Information Systems Management, Vol. 14, No. 1, Winter 1997, pp. 35-40.
- Overton, Keith, Mark N. Frolick, and Ronald B. Wilkes. "Politics of Implementing EISs," Information Systems Management, Vol. 13, No. 3, Summer 1996, pp. 50-57.
- Frolick, Mark N. and Barry P. Robichaux. "EIS Information Requirement Determination: Using A Group Support System to Enhance the Strategic Business Objectives Method," Decision Support Systems, Vol. 14, No. 2, June 1995, pp. 157-170.
- Gibbons, Chris, Corrine Chavez, Ronald B. Wilkes, and Mark N. Frolick. "Management Support System at PROMUS," Information Systems Management, Vol. 11, No. 3, Summer 1994, pp. 51-56.
- Frolick, Mark N. "Management Support Systems and Their Evolution from Executive Information Systems," Information Strategy: The Executive's Journal, Vol. 10, No. 3, Spring 1994, pp. 31-38.
- Frolick, Mark N. "The Importance of Executive Information Systems to IS Education," Interface, Vol. 15, No. 3, Fall 1993, pp. 33-36.
- Watson, Hugh J. and Mark N. Frolick. "A Field Study of Methods for Determining Information Requirements for an EIS," MIS Quarterly, Vol. 17, No. 3, September 1993, pp. 255-269.
- Frolick, Mark N. and Narender Ramarapu. "Hypermedia: The Future of EIS" Journal of Systems Management, Vol. 44, No. 7, July 1993, pp. 32-36.
- Frolick, Mark N. and Seavy Jennings. "EIS Software Selection at Georgia Power: A Structured Approach", Information Strategy: The Executive's Journal, Vol. 9, No. 3, Spring 1993, pp. 47-52.

Watson, Hugh J., R. Kelly Rainer, and Mark N. Frolick. "Executive Information Systems: An On-Going Study of Current Practices," International Information Systems, Vol. 1, No. 2, Spring 1992, pp. 37-56.

Watson, Hugh J. and Mark N. Frolick. "Executive Information Systems: Determining Information Requirements," Information Systems Management, Vol. 9, No. 2, Spring 1992, pp. 37-43.

Gunter, Amy and Mark N. Frolick. "The Evolution of EIS at Georgia Power", Information Executive, Vol. 4, No. 4, Fall 1991, pp. 23-26.

Supplemental Readings Location:

- Please see Blackboard
 - If you have trouble with Blackboard please contact Paul Kieffer at kieffer@xavier.edu or call him at 745-4883.

Grading

33% Participation and Contribution to Class Learning
33% Individual Paper
33% Group Presentation

Grading Scale

Overall Avg.	Letter Grade
94-100	A
90-93	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
60-69	D
59 & below	F

In-class Participation

Your participation in the classroom should demonstrate a strong knowledge of the assigned readings and activities. The instructors will evaluate your ability to synthesize, apply, and extend readings and professional experiences during class discussions and activities. Please focus on *quality*, *not quantity* of participation.

Some of the instructor expectations include:

- You are prepared for every class by reading all of the assigned material. You can demonstrate this preparation by referring to reading details in your in-class comments.
- You are prepared for class by thinking about discussion questions prior to class. You can demonstrate this preparation by providing thoughtful answers to the questions during class discussion.
- You will talk each class, regardless of the number of the students in the classroom.
- You will demonstrate the ability to extend and apply class materials by sharing work experiences and outside readings that are applicable and add value.
- Absolutely no computer usage during lectures, article discussion or case discussions. No exceptions!

Course Structure

Many classes will begin with a lecture to level set the week's material. This will help ensure that we will all be using the same nomenclature for the week's discussion.

The lecture will be followed with select article presentations/discussions. Students will be selected at random to lead article and note discussions. The article discussions will be followed by a case from either Harvard or TUN.

The professor realizes that with the busy schedules that most students have, getting together outside of normal class hours is often difficult. As such, once the article and case discussion have been completed, groups will be placed into breakout sessions to work on their group projects. This time is allotted for working on projects and should not be construed as class being let out early. The professor will be available during this period to offer guidance and answer any group questions. During this time, the professor will also be available to help with students individual research papers.

Case Presentations

Students must thoroughly analyze each case and article prior to class in order to ensure a rich and fruitful discussion. To that end, each student is to prepare a typed, detailed case

analysis which should include the cover page at the end of the syllabus. Please include your full name, course number, and email address. This document is to be done for the cases only, not the articles. The document should be printed single-sided and no longer than 2 pages. These will be collected at the end of class – hard copy only. This case analysis should contain, at a minimum, the "right questions" to be addressed which is described in HBS Note: 9-584-097 "An Introduction to Cases." In addition, please see the section titled "How to Prepare A Case" on page 2 of HBS Note: 9-376-241 "Learning with the Case Method." This note provides additional information that your cases analysis should contain. An overall theme that you will find helpful is the section titled "How You Can Get The Most Out Of The Case Process" on page 4 of HBS Note: 9-376-241 "Learning with the Case Method."

The case write-up will constitute 50% of your weekly grade. The other 50% will come from your weekly participation in the case discussions. Students must participate in the weekly case discussion in order to receive credit for that portion of their grade. One should realize that in order to properly prepare a case analysis, one should obtain industry and company data from sources outside the case.

Teams will be asked to volunteer to lead each case discussion. The discussion should include a case overview. Each of the issues in the evaluation form should be discussed. **Study groups are strongly recommended.**

Individual Paper:

You will be expected to write a quality research paper as a major part of your grade in this class. This is an information systems paper specifically addressing the area of Business Intelligence. Several students have gone on to actually publish the papers that they wrote for this class. To ensure that you do not wait until the last minute, the paper abstract is due at the class meeting for week 7. The abstract must be well thought out and demonstrate a contribution to the literature.

You must be able to answer the following questions with your abstract: 1) what am I saying that is both new and different and, 2) what is my contribution to the literature. The only way to answer these questions is by doing a VERY thorough literature search for your particular topic.

It is suggested that you obtain articles from several issues of the journal Information Systems Management. These articles will prove to be an invaluable help in structuring your research paper. Please use the APA style for referencing your sources.

The instructor is more than willing to spend time helping the students develop their abstracts. Please note that you should use no fewer than 15 - 20 references. The paper must be turned in as a hard copy. **Your email address must be on the cover page of the paper.**

Each student will provide a 5 minute verbal presentation of their individual research paper during the class scheduled for final exams.

Sample Individual Research Papers:

- Please see Blackboard
 - If you have trouble with Blackboard please contact Paul Kieffer at kieffer@xavier.edu or call him at 745-4883.

Plagiarism:

Plagiarism will cause the grade on any written assignment to be zero (0). Generally speaking, plagiarism should be considered the copying of more than three words in succession from the material being used, without placing the words in quotation marks. Since the written projects in this course are designed to focus on summarizing and discussing other peoples' materials, the assignments should include very few exact quotes.

Group Presentation

Students will work in small teams throughout the course on a business research project. Teams will select an actual information system within a company to research. The project will describe the information systems purpose, inputs, outputs, and the various business processes that are affected. The project should also specify (in as much detail as possible) who uses the information from the information system, how and for what purpose. Please include a discussion of the system's drawbacks (or areas for potential improvement) as well as its advantages. The above mentioned guidelines are merely suggestions. Please feel free to be as creative as you would like.

Students will make oral presentations of their research projects in class; presentations should be 25 minutes in length followed by a question and answer period. All team members should contribute equally in the project but not everyone has to participate in the presentation. Provide each member of the class with a 2-3 page executive summary of your approach and findings.

The project topic outline must be submitted to the professor for approval. This can be submitted verbally or in writing. Each research team is responsible for choosing a

research project; projects related to work experience are **strongly encouraged** but *be sensitive to company data confidentiality*.

Research projects should represent the students' best effort in academic and business research and writing. Plagiarism is illegal and not tolerated so be careful to correctly cite and provide references for the sources you use.

Teams and topics: Each team will select a different topic. The team must have a topic selected by week 6.

Topics will be assigned based on the order your requests were received, so please submit your choices as soon as possible.

Possible Topics: (These are just ideas. Please feel free to be creative here)

- Implications of legislation on warehousing and business intelligence practices
 - Sarbanes-Oxley, HIPAA, Patriot Act, etc.
- Managing unstructured data
 - Unstructured data warehouses per Bill Inmon; text mining; knowledge management in BI
- Active data warehousing
 - Closed- loop processes, active warehousing techniques
- Integration platforms or warehouse appliances
 - EII, virtual warehousing, appliances like Netezza
- Microsoft or SAP as viable enterprise analytical solutions
- The importance of data visualization
- Using warehousing/BI to measure business performance
 - BPM, BAM

Attendance Policy

Students are expected to attend every class. We will cover a lot of material each class and missing class will put you at a significant disadvantage for both learning and performance in the course. If you will be unable to attend a class, please let me know *in advance* by sending an e-mail 24 hours in advance. Recognize that it is your responsibility to get class notes and any assignments from a classmate.

Tentative Course Schedule		
Week	Topic	Cases / Reading
1 01/10	<ul style="list-style-type: none"> Course Overview 	
2 01/24	<ul style="list-style-type: none"> The Importance of the Case Method 	<ul style="list-style-type: none"> HBS Note: 9-451-005: Because Wisdom Can't Be Told HBS Note: 9-576-031: Introduction to the Case Method HBS Note: 9-584-097: Introduction to Cases HBS Note: 9-589-080: Learning with Cases HBS Note: 9-376-240: Use of Cases in Management Education HBS Note: 9-376-241: Learning by the Case Method
Business Intelligence		
3 01/31	<ul style="list-style-type: none"> Introduction to Business Intelligence 	<ul style="list-style-type: none"> Lecture - Introduction to BI TUN Article: Career Considerations in the Field of Business Intelligence Frolick Article: The Importance of Soft Skills in Business Intelligence Implementation Efforts (Hobeck, et al., 2009) HBS Case: 604080: Business Intelligence Software at SYSCO Research Paper Q&A
4 02/07	<ul style="list-style-type: none"> Business Intelligence (Cont.) 	<ul style="list-style-type: none"> TUN Article: The Shift to On-Demand Business Intelligence TUN Article: Four Strategies to Broaden BI Adoption Frolick Article: Business Intelligence in the Bayou: Recovering Costs in the Wake of Hurricane Katrina (Smith, et al., 2010) TUN Case: Continental Airlines Flies High with Real-Time Business Intelligence
5 02/14	<ul style="list-style-type: none"> Guest Speaker – Business Intelligence 	<ul style="list-style-type: none"> TBA

Data Warehousing		
6 02/21	<ul style="list-style-type: none"> • Data Warehousing 	<ul style="list-style-type: none"> • Lecture – Data Warehousing • TUN Article: Key Factors in Selecting a Data Warehouse Architecture • Frolick Article: 10 Principles to Ensure Your Data Warehouse Implementation is a Failure (Hill, et al., 2011) • TUN Case: BI at Retailstore.com
7 02/28	<ul style="list-style-type: none"> • Guest Speaker – Data Warehousing 	<ul style="list-style-type: none"> • Ryan McGuire - dunnhumby
Business Analytics		
8 03/13	<ul style="list-style-type: none"> • Business Analytics • Data Visualization 	<ul style="list-style-type: none"> • Lecture – Business Analytics • TUN Article: Business Analytics Insight • HBR Article R0601H: Competing on Analytics • HBS Case: R0705X9PDF-ENG: Dark Side of Customer Analytics
9 03/20	<ul style="list-style-type: none"> • Guest Speaker – Business Analytics 	<ul style="list-style-type: none"> • Michael Ohata - KPMG
10 03/27	<ul style="list-style-type: none"> • Research Lab 	<ul style="list-style-type: none"> • Teams to meet to scope out their research projects. <ul style="list-style-type: none"> • Presentation scope • Group member roles and responsibilities • Presentation timeline • Group deliverables
Data Mining		
11 04/03	<ul style="list-style-type: none"> • Data Mining 	<ul style="list-style-type: none"> • Lecture – Data, Text and Web Mining • Harvard Management Update Article: U9910D: Data Mining: What General Managers Need to Know • Frolick Article: Taking the Repeat Out of Research & Development: The BI collaboration Approach (Frolick & Von Oven, 2006) • TUN Case: Business Intelligence at Guthy-Renker
12 04/10	<ul style="list-style-type: none"> • Guest Speaker – Data Mining 	<ul style="list-style-type: none"> • Dan Coplen & Tony Mazza - Kroger

Business Performance Management		
13 04/17	<ul style="list-style-type: none"> • Business Performance Management 	<ul style="list-style-type: none"> • Business Performance Management – Oracle Keynote Address • HBR Article R0507Q: The Balanced Scorecard: Measures That Drive Performance. • Frolick Article: Critical Success Factors in Business Performance Management – Striving for Success (Ariyachandra and Frolick, 2008) • HBS Case 609103: Performance Management at Intermountain Healthcare • Hyperion Demo
Research Presentations		
14 04/24	<ul style="list-style-type: none"> • Research Project Presentations 	<ul style="list-style-type: none"> • Individual papers due

Final Exam – 05/01 :

Each student will provide a 5 minute verbal presentation of their individual research paper during the class scheduled for final exams.

Case Preparation Evaluation		Name :				
Case:						
Case Write-Up Evaluation – 50%	Evaluation					
	Very Effective.....			Very Ineffective		
• Who is the protagonist?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What are their objectives (implicit / explicit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What decisions (implicit / explicit) must I take?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What problems, opportunities and risks do I, as the protagonist face?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What evidence do I have to help make the decision? Is the evidence reliable and unbiased? Can I prove it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What alternative courses of action are available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What criteria should I use to judge the alternatives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What action should I take?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What outside industry and company data did I utilize?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• What did I learn from this case?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• How does it relate to past cases and my own 'live' experiences?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Case Participation Evaluation – 50%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall Assessment: A A- B+ B B- C+ C F						
Comments:						